

A Laboratory Technique for Producing Egg Masses of Douglas-fir Tussock Moth, *Orgyia pseudotsugata* (McDunnough), for Field Studies ¹

(Lepidoptera: Lymantriidae)

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Field collection of Douglas-fir tussock moth pupae and egg masses requires a great deal of time and energy because of the difficulty in locating them at low population densities, and the limited accessibility of those located in the upper branches. It is therefore desirable to use laboratory-reared stock for many field studies. Pupae or egg mass bearing cocoons have been used in various field studies including phenological correlations of the Douglas-fir tussock moth with its host (Wickman 1976, 1977), solar radiation effects on egg hatch,² and investigations dealing with egg parasitization and bird predation.³ This paper describes a technique for laboratory production of Douglas-fir tussock moth egg masses for field studies.

Larvae are reared according to the procedures of Thompson and Peterson.⁴ Once larvae have spun cocoons and pupated, each pupa is placed on a photographic light table to determine the sex. In this "candling" process, light is transmitted through the cocoon giving a clear view of the morphology of the enclosed pupa. Cocoons containing sexed pupae are collected in lots of 20 females and 20 to 25 males, 3 days older than the females. A thin wire (0.4 mm dia.), 13 cm (5 in.) long, is inserted through the cocoon of each female pupa, care being taken not to puncture the pupa with the wire as it is being inserted. The pupa is positioned in the center of the wire (Fig. 1). The ends of the wires of the 20 female pupae are then pushed through a 13 cm (5 in.) by 20 cm (8 in.) index card. This card is placed inside a kraft paper bag and secured to the side so that the cocoons face the interior of the bag. The male pupae are then placed in the bottom of the bag. The bag may be sealed with a staple or paper clip and placed at a temperature of 21°-23°C (70°-73°F).

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²Personal communication with B.E. Wickman of the Pacific Northwest Forest and Range Experiment Station, Corvallis, Oreg.

³Personal communication with T.R. Torgersen and R.R. Mason of the Pacific Northwest Forest and Range Experiment Station, Corvallis, Oreg., concerning current studies and manuscripts in preparation.

⁴Thompson, C.G. and L.J. Peterson. How to rear the Douglas-fir tussock moth. Manuscript in preparation at Pacific Northwest Forest and Range Experiment Station, Corvallis, Oreg.

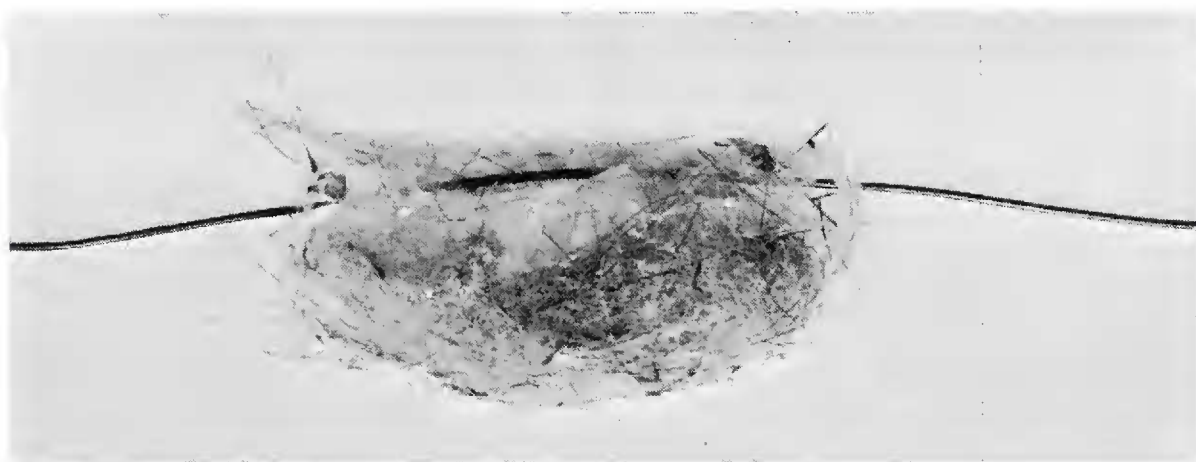


Fig. 1, insertion of wire through the cocoon. (Line equals 25 mm).

In 7 to 10 days, the male and female pupae emerge as adult moths. Upon emergence of the female moth, she immediately climbs onto the empty cocoon from which she emerged. Mating takes place on the cocoon. The female moth oviposits on the cocoon shortly after mating, laying an oval shaped egg mass covered with spumaline.

One month from the collection date of the pupae, the index card will contain 20 wired empty cocoons each covered with an egg mass (Fig. 2).

This technique of using prepared cocoons is useful principally for field studies utilizing pupae or egg masses. The cocoon or egg mass is easily fastened in place by interlacing the wire between the needles on a branch (Fig. 3) (see footnote 3). There are several practi-

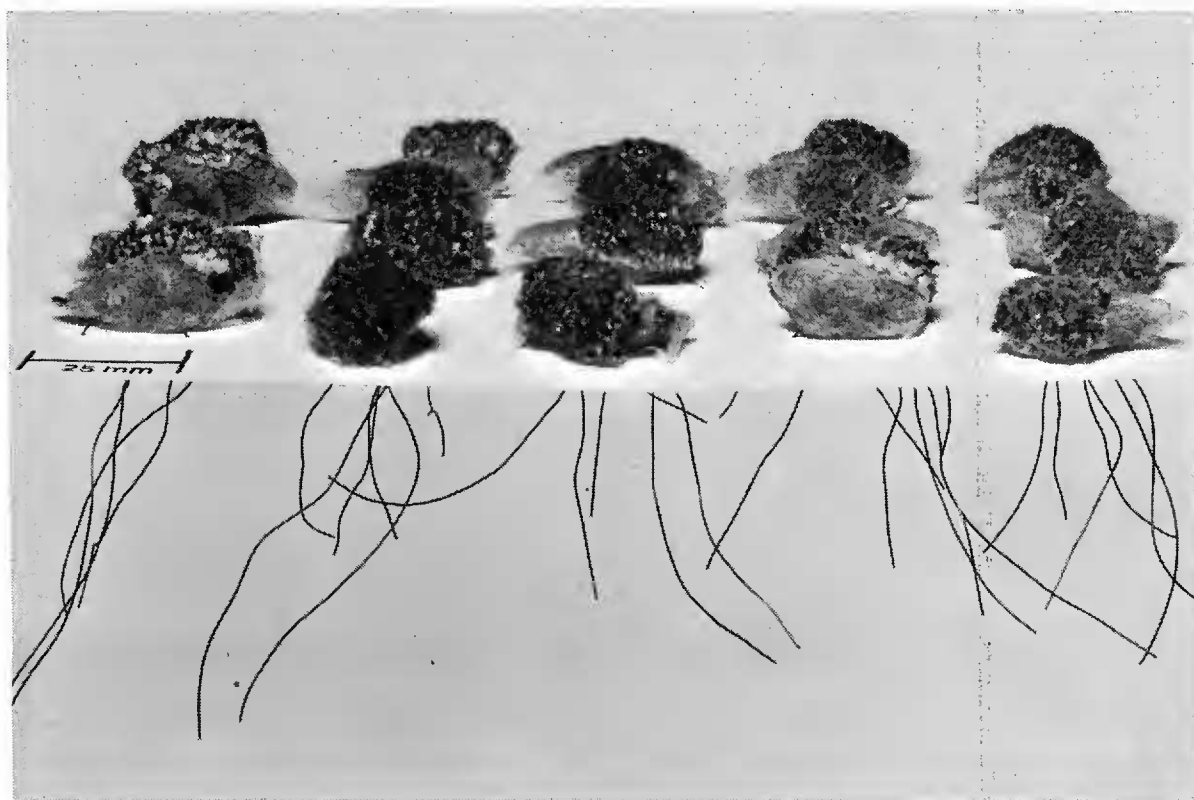


Fig. 2, Demonstrates wire technique.



Fig. 3, Demonstrates interlacing of wire between the needles of the branch.

cal benefits derived by using the technique. There is minimal handling of the egg masses, thereby reducing the possibility of irritation to the worker caused by touching the hairy cocoons. With the cocoons and masses wired onto the index card, it is easy to keep inventory of those taken into the field; and substantial egg mass protection is offered by the index card when being handled. Opportunity to select only the choicest egg masses or cocoons for field use is afforded because they are easily accessible. Finally, the wired egg masses present a natural appearance so experimental artifacts are largely eliminated.

Literature Cited

- Wickman, B.E. 1976. Phenology of white fir and Douglas-fir tussock moth egg hatch and larval development in California. *Environ. Entomol.* 5(2):316-322, illus.
- Wickman, B.E. 1977. Douglas-fir tussock moth egg hatch and larval development in relation to phenology of white fir in southern Oregon. USDA For. Serv. Res. Note PNW-295, 9 p., illus. Pacific Northwest Forest and Range Experiment Station, Portland, Oreg.